

Medknow

Print ISSN 2542-629X
Online ISSN 2226-8561

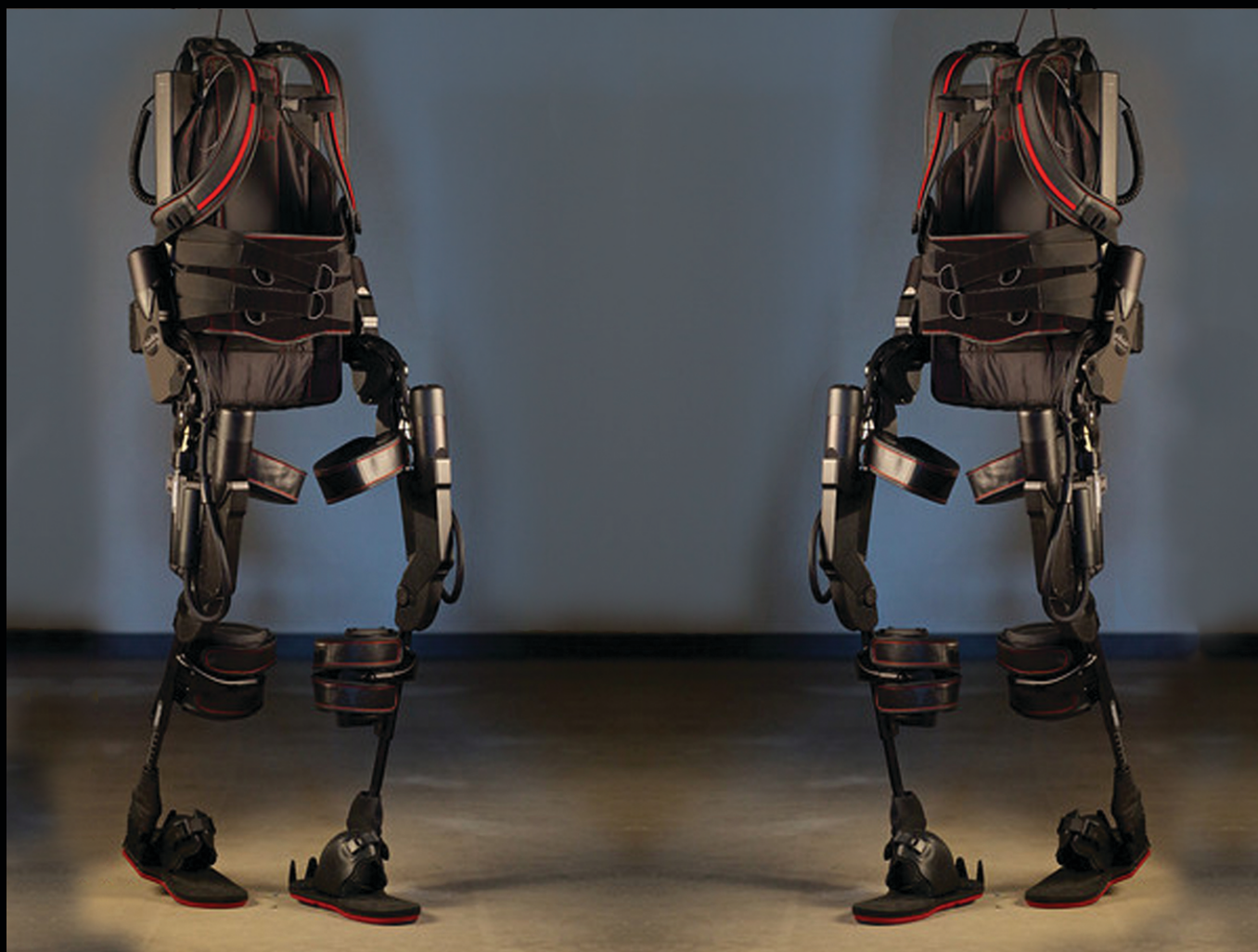
 Wolters Kluwer

Digital Medicine

Issue 4 | Volume 2 | Oct-Dec 2016



Spring Media Publishing



Medicine (basic & clinical)

Mathematics

Informatics

Biomedical & Mechanical Engineering

Increasing adherence in therapies and polypharmacy in Europe: EIP on AHA Action Group A1 activities toward integrated care information systems and self-management applications

Homer Papadopoulos^{1*}, Anna Giardini², Elisio Costa³, Alessandro Monaco⁴, Alpana Mair⁵, Clara Cena⁶, Giuseppe Fico⁷

¹National Center for Scientific Research - Demokritos, Athens, Greece, ²Psychology Unit ICS Maugeri Institutes, Institute of Care and Research of Montescano (PV), Italy, ³UCIBIO, REQUIMTE, Department of Biological Sciences, Faculty of Pharmacy, University of Porto, Portugal, ⁴Economic Strategy and Pharmaceutical Policy department, Italian Medicines Agency – AIFA, Italy, ⁵Scottish Government, department- Health and Social care Directorate, Scotland, United Kingdom, ⁶Department of Drug Science and Technology, University of Torino, Italy, ⁷Photonic and Bioengineering Department, Universidad Politécnica de Madrid (Technical University of Madrid), Madrid, Spain

INTRODUCTION

Due to population aging, increase in chronic disease and increased life expectancy, the number of people living with more than one chronic condition is increasing. It is estimated that 50 million European citizens suffer from multimorbidity (http://ec.europa.eu/health/ageing/docs/ev_20151007_frep_en.pdf). Among people over the age of 65, about 65% have multiple chronic diseases; for individuals aged 85+ multiple chronic diseases' incidence is estimated at 85%.^[1] Therefore, the number of people living with multimorbidity in the Europe is expected to increase further.

Multimorbidity (living with two or more medical conditions where one is not necessarily more central than the others - https://ec.europa.eu/eip/ageing/news/conference-which-priorities-european-policy-multimorbidity-27th-october-organized-european_en) has attracted significant attention among policymakers and stakeholders, also because adults with multimorbidity account for more than two-thirds of health-care costs.^[2] Multimorbidity impacts several levels of civil society: The individual (the quality of life of patients and their families), the quality and organization of health-care services at a local level and the whole healthcare system

(health and social care services as well as high public and private expenditure).^[3] Patient adherence is defined as the extent to which a person's behavior, (taking medication, following a diet, or executing lifestyle changes) corresponds with agreed recommendations from a health care provider. Polypharmacy and patient adherence and the importance (Scottish Polypharmacy 2015 guidance. Model of care group, Scottish Government 2015. <http://www.polypharmacy.scot.nhs.uk/>) to involve patients and families with regard to goal setting are problems that patients with multimorbidity are facing.^[4]

More specifically polypharmacy is associated with several risks, including adverse drug reactions, risk of medication and disease interactions, and inappropriate dosing and adherence. On the other hand, patients could benefit from multiple medications if properly addressed when medications are combined to cure, slow the progression or reduce the symptoms of the diseases.^[5]

As the consequence of morbidity, polypharmacy is associated with age and poor self-rated health.^[6] Furthermore, many patients with multi-morbidity experience difficulty in following (agreed upon) treatment recommendations. According to the WHO, only 50% of patients are adherent to long-term therapy for chronic illnesses.^[7] Consequently, if patient complexity can be challenging when addressing treatment goals for one condition, it will become ever more complex when attempting to prioritize treatment

*Address for correspondence:

Dr. Homer Papadopoulos, National Center for Scientific Research - Demokritos, Athens, Greece.
E-mail: homerpap@dat.demokritos.gr

targets for multiple conditions.^[8] Of course, despite the growing number of people with multiple chronic conditions, the majority of treatment guidelines focus on single disease and rarely address how to optimally integrate care for people with multimorbidity.^[9] It is clear that still there is not sufficient evidence on how to understand and deal with multimorbidity patterns (http://ec.europa.eu/health/ageing/docs/ev_20151007_frep_en.pdf) and consequent patients' behavior toward adherence.

Following the above need, patient adherence to medical plans represents a focus of the European Innovation Partnership on Active and Healthy Ageing (<https://ec.europa.eu/eip/ageing/>), originally set up by European Commission. A clear reflection of this fact is the foundation of Action Group (AG) A1 "Prescription and Adherence to Medical Plans" (https://ec.europa.eu/research/innovation-union/pdf/active-healthy-ageing/a1_achievements_2015.pdf). To address this need AG A1 adopted an action plan where it identified the most relevant areas of activities to address the adherence problem.

ACTIONS OF THE AG A1

In agreement with the overall goals and triple win defined in the Strategic Implementation Plan (http://ec.europa.eu/research/innovationunion/pdf/active-healthy-ageing/steeringgroup/implementation_plan.pdf#view=fit&pagemode=none) (SIP) of the EIP on AHA, the A1 AG aims to contribute to the improvement of adherence to medical plans and medication at the European level under the pillar "Prevention, screening and early diagnosis."

In particular, the implementation plan called for a set of actions to be launched, including the delivery of a prescription and adherence action at regional level, as well as the development of innovative tools and applications to promote health literacy and patient empowerment for informed lifestyle choices. To meet the challenges posed by the SIP and to boost the effectiveness of their work, the AG A1 partners decided to launch a renovated Action Plan. The process to gather ideas for the AG A1 renovated Action Plan was a well-structured, transparent process that was open for every AG A1 member and included several steps, namely participatory meetings and on-line surveys. During this process stakeholders pointed out that the A1 vision should be inspired along several themes, e.g.:

- "Adopt a holistic approach of adherence"
- "Improve communication skills of health professionals when dealing with patients and care givers"
- "Exploit the potential of information and communication technology (ICT) for better adherence"

- "Disseminate the impact of nonadherence amongst policy-makers"
- "Identify and disseminate promising practices"
- "Recognise the Pharmacist as a key player in improving prescriptions, addressing appropriate polypharmacy and supporting adherence to treatments"
- "Promoting the role of the pharmacist and improvement of the collaborative work between healthcare professionals to manage appropriate polypharmacy"
- "To provide more information aimed at patients on pharmacological treatments and chronic diseases within the elderly population"

In agreement with the overall goals of the EIP on AHA to improve the quality of life, increase the sustainability of systems and services and increase the competitiveness of the EU economy, the AG A1 [Figure 1] aims to contribute to 4 general objectives that are listed below:

- General objective 1: Research and advocacy on adherence
- General objective 2: Reinforce addressing appropriate polypharmacy and the role of the pharmacist
- General objective 3: Education and empowerment
- General objective 4: Exploit the potential of ICT for better adherence.

Figure 1 representatives of the A1 AG during the European Summit on Innovation for Active and Healthy Ageing (https://ec.europa.eu/eip/ageing/events/european-summit-innovation-active-and-healthy-ageing-transforming-future-health-and-care_en): Transforming the future of Health and Care in Europe.

To support the activities of the A1 group a synergy action has also been established. Synergies are thematic working groups that are established through a collaborative approach and whose interests are cross-cutting to at least two or more AGs of the EIP on AHA [Figure 2]. The synergies include collaborative work and sprints that were agreed on among representatives from the different AGs involved. Thus, the "Information technology and adherence in aging population with chronic diseases and polypharmacy" A1 synergy group has been formed with the aim to increase the adherence to treatment of older age adults with chronic diseases and polypharmacy by:

- i. Assessing the role of ICT - based solutions such as advanced processing of data, decision support applications and remote monitoring and consultation systems, and by
- ii. Implementing tailored ICT-based interventions. We expect that the knowledge that will be created will support stakeholders to take action in the direction

of improving the quality of life of the elderly population.

SPECIFIC ACTIONS OF THE A1 SYNERGY GROUP AND THE G04-A1 GROUP

Progress in ICT can facilitate personalized solutions for better prevention and engagement in active and healthy aging. These advancements supported by the digital transformation in health and care and the computerization of medicine can support adherence in therapies while empowering the active role of patients in self-managing their diseases. The objectives of the A1 synergy and G04-A1 group are to provide an overview of how advanced information technologies of decision support applications, AI and IoT can create a monitoring environment that could increase adherence to treatment of older age adults with multiple chronic diseases and long-term therapies and appropriate polypharmacy.

Figure 2 shows more than 100 entities (universities, Small and Medium Enterprises, Research Centers) are participating in the A1 synergy group.

Furthermore, within the framework of their activities these groups identified the need to study how integrated care systems can support polypharmacy and to understand which role integrated care systems, applications and monitoring data can play for measurement of adherence and of changes in the patient's behavior and lifestyle.

Integrated care systems have the potential to respond to the challenge of providing good qualitative and sustainable care to patients with multimorbidity. It is characterized as patient-centered, proactive and well-coordinated multidisciplinary care, using new technologies to support patients' self-management and adherence to medical plans and improve collaboration between caregivers. So

far, there is insufficient evidence for the beneficial effect of integrated care on patient outcomes, patient adherence, health-care utilization and costs.^[10]

Thus, a scoping study has been initiated to review best practices and available literature and to assess whether integrated information systems that connect patient with health-care professionals can boost adherence to old age people in long-term therapies and polypharmacy. The study is a working document within the realm of the EIP on AHA synergy group with an intention to inform the EU of the current status of and gaps in available ICT technology in use.

A scoping study has been adopted because it can provide synthesis and analysis of a wide range of research and nonresearch material to provide greater conceptual clarity about a specific topic or field of evidence^[11] and then set this within policy and practice contexts.^[12]

The scoping study will adopt the methodological framework proposed by Arksey and O'Malley^[13] since this framework provides a supportive foundation for scoping study methodology. Recommendations for each stage of the framework, followed by considerations for the advancement, application, and relevance of scoping studies in health research have also been proposed.^[14]

The objectives that are set for the scoping study are as follows.

GENERAL OBJECTIVES OF THE SCOPING STUDY

To increase the adherence to treatment of older age adults with chronic multi-diseases and long-term therapies and appropriate polypharmacy:

- i. Assessing the role of ICT-based solutions in understanding adherence behavior and minimizing adverse drug reaction accounting for therapeutic failure and complications like increase in falls and
- ii. Implementing tailored ICT-based interventions
- iii. Supporting necessary changes in the direction of improving elderlies' quality of life.

SPECIFIC OBJECTIVES OF THE SCOPING STUDY

1. To identify and review a relevant number of ICT tools for adherence in long-term therapies and polypharmacy and identify the best-in-class.

The study will review best practices and available literature to assess whether ICT-based applications that support monitoring of behavior, training, patient



Figure 1: Representatives of the A1 Action Group during the European Summit on Innovation for Active and Healthy Ageing: Transforming the future of Health and Care in Europe

 www.articatelemedicina.com	 www.esenf.pt	 www.trilogis.it	 www.parkinsonmadrid.org
 www.hi-iberia.es	 www.ismai.pt	 www.eltrun.gr	 www.cirff.it
 www.atenzia.com	 en.unito.it	 www.i3s.up.pt	 www.obme.hu
 www.ferrer.com	 www.syndesis.eu	 www.tue.nl	 www.rcsi.ie
 www.mevia.se	 www.ineb.up.pt	 www.irst.emr.it	 www.nively.com
 www.demokritos.gr	 www.dstf.unito.it	 salute.regione.emilia-romagna.it	

Figure 2: Indicative list of the Entities (universities, SMEs, Research Centers) that are actively participating in the A1 Synergy Group. The A1 Synergy group has been established to study common ICT and integrated care topics between A1, B3, C2, A2 and A3 action groups. The A1 Synergy activities aim to harness the collected data from relevant running pilots and from data sets from the above EIP on AHA action groups as well as from global best practices and results from specialized workshops. Its general objective is to study if the role of integrated information systems that connect patient with health care professionals, pharmacists and other stakeholders can boost adherence to old age people in long-term therapies and polypharmacy

empowerment and social interactions can change behavior and increase the adherence of older age adults to treatment. Results from running pilots and relevant data sets from similar studies in EU will be explored.

The study will consider technological platforms and solutions and will examine existing technical solutions along with semantic interoperability requirements.

Furthermore, we will study how advanced ICT developments such as decision support applications, big data, and others can create a monitoring environment that will increase appropriate polypharmacy minimizing adverse events like falls. The results of this study will help us.

2. To understand the feasibility of introducing ICT tools and applications dedicated to adherence within the realm of integrated information systems that connect patient with health care professionals and other stakeholders (e.g., patients, family members, health and social carers, and members of municipalities, hospitals, social care entities). The role of pharmacists will be considered.
3. To find evidence where possible of the impact of ICT tools for Adherence in Health Services. Impact is defined as the effect of the use of ICT tools for adherence on financial savings and quality of life.

The study will try to provide a reference of the requirements that an ICT adherence system should comply to and provide an architecture design methodology and the key technological building blocks that should be adopted.

REFERENCES

1. Marengoni A, Angleman S, Melis R, Mangialasche F, Karp A, Garmen A, *et al.* Aging with multimorbidity: A systematic review of the literature. *Ageing Res Rev* 2011;10:430-9.
2. Bower P, Macdonald W, Harkness E, Gask L, Kendrick T, Valderas JM, *et al.* Multimorbidity, service organization and clinical decision making in primary care: A qualitative study. *Fam Pract* 2011;28:579-87.
3. Smith SM, Soubhi H, Fortin M, Hudon C, O'Dowd T. Interventions for improving outcomes in patients with multimorbidity in primary care and community settings. *Cochrane Database Syst Rev* 2012;4:CD006560.
4. Nuño R, Sauto R, Toro N. Integrated care initiatives in the Spanish Health System/Experiencias de integración asistencial en el Sistema Nacional de Salud de España: Abstracts from the Third Spanish Conference on Chronic Care, San Sebastián, 19–20 May 2011/ Resúmenes de Comunicaciones al III Congreso Nacional de Atención Sanitaria al Paciente Crónico, Donostia-San Sebastián, 19 y 20 de mayo del 2011. *Int J Integr Care* 2012;12 Suppl 2:e35.
5. Duerden M, Avery T, Payne R. Polypharmacy and medicines optimisation. Making it safe and sound. The Kings Fund; 2013. Available from: https://www.kingsfund.org.uk/sites/files/kf/field/field_publication_file/polypharmacy-and-medicines-optimisation-kingsfund-nov13.pdf.
6. Moen J, Antonov K, Larsson CA, Lindblad U, Nilsson JL, Råstam L, *et al.* Factors associated with multiple medication use in different age groups. *Ann Pharmacother* 2009;43:1978-85.
7. Sabaté E. Adherence to Long-term Therapies: Evidence for Action. Geneva: World Health Organization; 2003.
8. Ritchie C. Health care quality and multimorbidity: The jury is still out. *Med Care* 2007;45:477-9.
9. Hughes LD, McMurdo ME, Guthrie B. Guidelines for people not for diseases: the challenges of applying UK clinical guidelines to people with multimorbidity. *Age Ageing* 2013;42:62-9.
10. de Bruin SR, Versnel N, Lemmens LC, Molema CC, Schellevis FG, Nijpels G, *et al.* Comprehensive care programs for patients with multiple chronic conditions: A systematic literature review. *Health Policy* 2012;107:108-45.
11. Davis K, Drey N, Gould D. What are scoping studies? A review of the nursing literature. *Int J Nurs Stud* 2009;46:1386-400.
12. Anderson S, Allen P, Peckham S, Goodwin N. Asking the right questions: Scoping studies in the commissioning of research on the organisation and delivery of health services. *Health Res Policy Syst* 2008;6:7.
13. Arksey H, O'Malley L. Scoping studies: Towards a methodological framework. *Int J Soc Res Methodol* 2005;8:19-32.
14. Levac D, Colquhoun H, O'Brien KK. Scoping studies: Advancing the methodology. *Implement Sci* 2010;5:69.

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

Access this article online

Quick Response Code



Website:

www.digitmedicine.com

DOI:

10.4103/digm.digm_1_17

How to cite this article: Papadopoulos H, Giardini A, Costa E, Monaco A, Mair A, Cena C, *et al.* Increasing adherence in therapies and polypharmacy in Europe: EIP on AHA Action Group A1 activities toward integrated care information systems and self-management applications. *Digit Med* 2016;2:144-8.